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Southwestern MEDICINE

OFFICIAL JOURNAL OF THE SOUTHWESTERN MEDICAL ASSOCIATION AND EL PASO COUNTY MEDICAL SOCIETY

January, 1951

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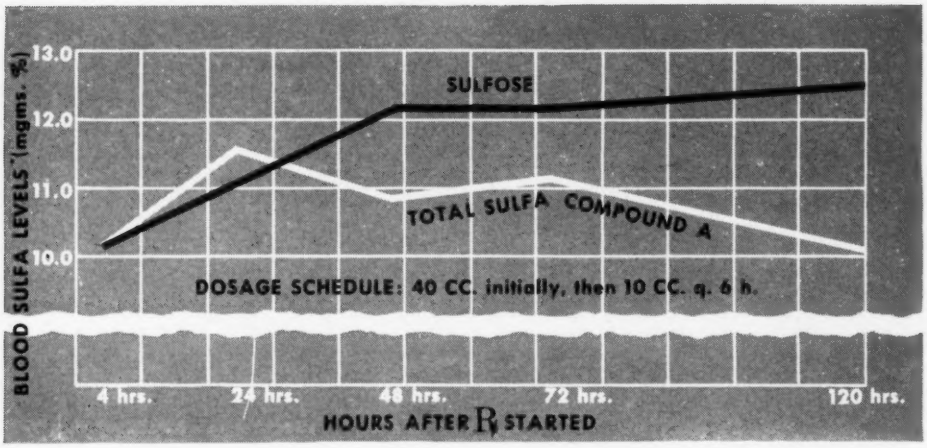

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EARLY DIAGNOSIS IN CARCINOMA OF THE LUNG

Each year brings a shift in the population. The Southwest always receives in this shift a goodly number of individuals with some type of pulmonary disease. A very definite percentage of these people are elderly and come to the Southwest with pulmonary disease in the hope that they will be directly benefited by a change in climate. It behooves physicians in this area constantly to be alert regarding the possibility of pulmonary neoplastic disease. By necessity because of the influx of the aforementioned type of case, our percentage of pulmonary neoplasm well may be higher than in other parts of the country. We must remember that not everything that wheezes is asthma. This is especially true in the elderly male, when we consider that carcinoma of the lung is more prevalent in the male, and occurs particularly in the fifth decade. While it occurs in younger patients, it is essentially a lesion of the elderly.

SCIENTIFIC PAPERS

In this particular issue of SOUTHWESTERN MEDICINE there are being presented two scientific papers on carcinoma of the lung. Both papers were presented to the physicians of the Southwest with the sincere hope that an early diagnosis could be made. Dr. Gale states definitely that on the average eight months elapse before these patients reach the surgeon. Realizing full well that early surgical intervention offers the only hope in these individuals, we must bend our backs and put forth our best efforts to bring these patients to the pulmonary surgeon as early as is possible. In all probability there are none of us who have not been guilty of temporizing with lung disease. And, as a result of this particular type of procrastination, most of us have seen bronchial carcinoma progress under our very eyes. It must be realized that often this could not be really called procrastination. The economic status of the patient at times severely impedes the possibility of a proper diagnostic work-up; but various agencies, such as our local Cancer Clinic, may well afford this particular type of work-up, and if the patient cannot afford it, then an admission to this particular type of facility is indicated.

OSLER SPEAKS

Many years ago, Sir William Osler, in speaking of pulmonary tuberculosis, said in substance that half of the diagnosis of pulmonary tuberculosis is to be on the look-out for it. This same can be readily applied to bronchial carcinoma. Persistent cough at any age should call for proper investigation. Carcinoma of the lung occurs five times as often in the male as in the female, and the majority of cases occur after the age of forty. Therefore, it would seem that a patient with a persistent, undiagnosed cough, after the age of forty, especially a male, should be considered as suffering from neoplastic disease of the lung until this possibility has been definitely ruled out. All of us have been guilty of depending too much on an AP view on an x-ray film. It is a simple matter to have a lateral view, but how often this is neglected; and this neglect may mean the difference between early diagnosis and late diagnosis. There are those who hesitate to have bronchoscopic study, sometimes for economic reasons, and sometimes because the examination is distasteful to the patient. It is far better to have an unnecessary bronchoscopic examination which does not endanger the patient's life, than to risk the liability of a suspicious chain of symptoms referring to the lung. The same may be said for exploratory thoracotomy. In the past decade, improvement in technique and anesthesia has rendered thoracotomy a relatively safe procedure, and, indeed, many authorities on the subject agree with Robert Coope in England, who states, "Exploratory thoracotomy is not more serious, probably less so, than exploratory laparatomy." This we must give due consideration. When we consider that primary carcinoma of the lung is only exceeded in frequency by carcinoma of the gastrointestinal tract, skin, and prostate, it behooves us to be constantly on the alert for this type of lesion.

ANNUAL MEETING

At the Annual Meeting of the Southwestern Medical Association, both in 1949 and 1950, consideration of bronchial carcinoma was given. SOUTHWESTERN MEDICINE is publishing both scientific papers. It is the hope that by continuously bringing to the practitioner of medicine the possibility of this particular lung lesion, that these patients will reach the surgeon at an earlier date, and that we will be able to have at least double the number alive five years following the surgical procedure. We must become carcinoma-conscious. This consciousness, because of the particular type of individual we have in the Southwest, must be more acute than in other locations in our country.

SOUTHWESTERN NEW MEXICO MEDICAL AUXILIARY FORMED

Plans for development of the recently-organized Southwestern New Mexico Medical Auxiliary are being made under the leadership of Mrs. Leland S. Evans, Las Cruces, president of the new organization.

The auxiliary was formed recently at a meeting in Deming, N. M. Other officers are Mrs. L. J. Whitaker of Deming, vice-president; Mrs. Sidney Baker of Silver City, recording secretary; and Mrs. Gerald Slusser, Silver City, treasurer.

Mrs. Carl Mulky, Albuquerque, president of the New Mexico Medical Society Auxiliary, was present in Deming to assist with the organization.

Mrs. L. A. McRae of Albuquerque spoke at the organizational meeting on the fight against compulsory health insurance.

Wilm's Tumors in Adults

Wilm's tumors seldom occur in adults. When they appear, they are usually malignant and invasive. These lesions are most often located intrarenally. Diagnosis is difficult prior to operation or autopsy. However, roentgenographical examinations are fairly dependable diagnostic aids. Prognosis is more favorable in adults with Wilm's tumor than in children.

Hellsten, H.: A Case of Wilm's Tumor in an Adult Acta chir. Scandinav. 99:259 (Dec.) 1949.

Carcinoma of the Testicle with Metastasis to the Bone

Bone metastasis in cancer of the testis is an unusual manifestation. However, if bone pain occurs in patients with testicular cancer, radical roentgen treatment should be given regardless of whether metastasis can be demonstrated. Roentgen irradiation not only relieves pain from these lesions, but if given in sufficient dosage, it will sterilize the metastatic foci.

Lafferty, J., and Pendergrass, E.: Carcinoma of the Testicle with Metastasis to Bone. Am. J. Roentgenol. 63:95 (Jan.) 1950.

De Rebus Medicis Et Politicis

BY ROBERT B. HOMAN, JR., M. D., EL PASO, TEXAS
MEMBER OF THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION

THE HOUSE OF DELEGATES AT CLEVELAND

Certain actions taken by the A. M. A. House of Delegates at the Cleveland Clinical Session should be of interest to the profession. Some of these actions have far-reaching implications and represent the attitude of the profession on controversial health problems confronting the nation.

The Delegates once again re-affirmed the A. M. A.'s favorable position toward the necessity of adequate public health services throughout the nation. American Medicine has always favored public health services. Recently the profession has been accused of opposing these necessary services, because of its opposition to H. R. 5865. This bill would appropriate Federal funds to be matched by State and local funds to establish Public Health Units throughout the country. The A. M. A. opposes the bill in its present form because actual control of these units is placed in the hands of the Surgeon General (U. S. P. H. S.) in Washington, and because it provided for "detection and diagnosis of chronic diseases". This latter provision would, of course, put these units into the practice of medicine.

HOUSE RECOMMENDATION

Regarding the matter of these public health units the House passed the following recommendation of its Reference Committee on Legislation and Public Relations — "In the opinion of our committee, it is the desire of the House of Delegates to re-affirm its long-established approval of the extension of public health activities for the protection of the people and, if necessary, to accept Federal aid for this purpose. In expressing this opinion, we wish to re-emphasize that the services of the departments of public health should be limited to: 1. Vital statistics. 2. Public health education. 3. Environmental sanitation. 4. Public health laboratories. 5. Prevention and control of communicable diseases. 6. Hygiene of maternity, infancy and childhood, if private facilities are unavailable. It is the further opinion of your committee that it is the wish of this House to delete from any Federal legislation that may be directed toward this problem, all chance or possibility of federal domination of local programs, and to leave the direction and administration of such programs to local authorities".

For many years American medicine has asked for a federal department of health with a secretary of cabinet rank. This objective is apparently unattainable at the present time, even though it is obvious that health activities are spread throughout many departments and agencies of the government. In order to remedy this situation the House recommended "the passage into law of a bill providing for the co-ordination and integration of all federal health activities under an independent agency with executive status except the medical services of the armed forces and of the Veteran's Administration". Such a law would thus establish an independent federal health agency in the executive branch of government. It would relieve Mr. Ewing of all his health activities.

A. M. A. ATTACKED

Federal aid to medical education has been opposed by the A. M. A. and the organization has been subjected to rather vicious attack for this stand. An article in **Colliers** (December 16) is an example of this attack. To be consistent, American medicine must oppose any measure that poses federal domination of any phase of private practice, and it is felt that this "fringe" bill poses such a threat. Privately endowed colleges, medical and others, are in serious financial straits because of markedly increased cost of operation and relatively low income from endowments due to low interest rates and due to high taxation which inhibits increased endowments of all types.

American medicine believes that all sources of private endowments for medical education must be utilized before federal aid with its control is called upon. With this in mind, the Board of Trustees, with the endorsement of the House of Delegates, announced a gift of one-half million dollars to the medical schools of the nation — with no strings attached. At the same time, the Association called upon industry, labor, organizations, doctors, and individuals to contribute to this fund annually in order to meet the pressing financial problem of the medical schools and to preserve their individual freedom.

"KEEPING FAITH"

In announcing this gift from the National Education Campaign Fund of the A. M. A., Dr. Louis H. Bauer, Chairman of the Board of Trustees, said, in part, "The Board of Trustees feels that it is keeping faith with the American people, who have given medicine such a splendid vote of confidence, when it contributes this amount to the medical schools of the nation. There is a growing public awareness that Federal subsidy has come to be a burden, not a bounty for it is bringing intolerable increases in taxation, and is dangerously increasing Federal controls over our institutions and the lives of our people."

PLASTER BANDAGES

Sterilization Of Plaster Bandages With Ethylene Oxide

Wilson, A. T., J.A.M.A. 142:1067, 1950

Plaster of Paris bandages placed in a suitable receptacle can be satisfactorily sterilized by means of ethylene oxide. The author currently uses a commercial pressure cooker, all openings of which are sealed, except one, which is fitted with a metal stopcock. The cooker, containing bandages from which paper wrappings have been removed, is chilled for one hour and 10 cc. chilled ethylene oxide introduced. All openings are closed and the container placed in an incubator overnight at 37 C. When opening the cooker it should be remembered that ethylene oxide in sufficient concentration is toxic and explosive. Provision should be made to prevent local accumulation of the gas in the air.

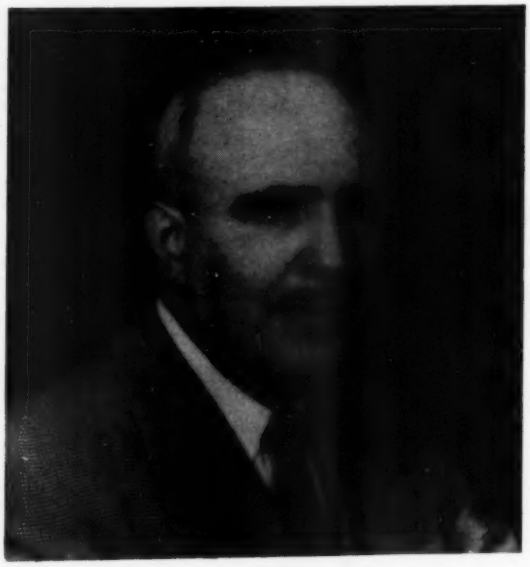
DR. FRANK SCHUSTER TO HEAD EL PASO COUNTY MEDICAL SOCIETY

Dr. Frank P. Schuster, member of a pioneer El Paso medical family, has been elected president of the El Paso County Medical Society for 1950-51.

Dr. Schuster will replace Dr. Ralph H. Homan, president for 1949-50. Other officers for 1950-51 are Dr. Leigh E. Wilcox, president-elect; Dr. Branch Craige, vice-president; and Dr. Howard J. H. Marshall, secretary-treasurer.

Other retiring officers of the Society for 1949-50 are Dr. Henry D. Garrett, vice-president; and Dr. Joe R. Floyd, secretary-treasurer.

A native of El Paso, Dr. Schuster has been practicing medicine in El Paso since 1921. His father, the late Dr. Michael P. Schuster, founded Providence Memorial Hospital in 1902. His brother, Dr. Stephen A. Schuster, is a past president of El Paso County Medical Society. The Drs. Schuster are in partnership with Dr. Newton F. Walker.



Dr. Frank P. Schuster

BORN IN EL PASO

The newly-elected president was born in El Paso on Jan. 4, 1895. He was educated in El Paso grammer schools, was graduated from Western Military Academy at Upper Alton, Ill., and received his Bachelor of Science degree from the University of Chicago. In 1918 he was graduated from Rush Medical College. He served in the Army Medical Corps in 1918.

Dr. Schuster took his interneship in the Presbyterian Hospital and Cook County Hospital in Chicago. He completed his residency in eye, ear, nose and throat work in Cook County Hospital in 1921.

Dr. Schuster was certified by the National Board of Medical Examiners in 1920 and selected as a Fellow in the American College of Surgeons in 1925. Also in 1925, he was elected to the American Academy of Opthalmology and Otolaryngology. In 1926 he took post-graduate work at the University of Vienna and was certified as a diplomate by the American Board of Otolaryngology. In 1927 and 1928 he served as a medical examiner for the Aeronautics Branch of the Department of Commerce. He became a member of the American Laryngolical, Rhinological and Otological Society in 1935. In World War II he was on the medical advisory board for Selective Service in Texas.

CHIEF OF STAFF

Dr. Schuster served a three-year-term with the local medical society's board of censors from 1946 to 1949. In 1949 he was chief of staff at Providence Memorial Hospital, a position which he has also filled at El Paso General Hospital. He is a member of the visiting staffs at Hotel Dieu and Southwestern General Hospital.

Dr. Schuster is a member of Nu Sigma Nu, Alpha Omega Alpha, the Rotary Club and the Masons. He is an elder of the First Presbyterian Church.

Dr. and Mrs. Schuster reside at 939 Rim Road. Their son, Frank, Jr., is a medical student at the University of Texas branch at Galveston. Their daughter, Jarratt, is a student at Stephens College at Columbia, Mo. Dr. Schuster has two sisters, Mrs. Regina Rabb and Mrs. Margaret Schuster Meyer, both of El Paso.

Effects of Combined Injections of Deoxycortone Acetate and Ascorbic Acid on Rheumatoid Arthritis

"The series comprises 9 patients (6 women and 3 men) with both mild and severe rheumatic disease of the joints of two weeks' to fifteen years' standing. . . . The patients were treated with an intramuscular injection of 5 mg. Deoxycortone (desoxycorticosterone) acetate in 1 ml. of oleum arachis, immediately followed by an intravenous injection of 1 g. ascorbic acid (10 ml. of 10% solution). Five minutes after the injections the articular pain began to diminish and the articular mobility began to increase. Fifteen to thirty minutes later, the pain had practically disappeared and the mobility improved as much as the anatomical changes in the joints and muscular atrophy would allow. All the patients reacted in a similar way. In some cases the improvement was astounding. . . . The effect lasted from two to six hours, occasionally more than twenty-four hours. It seems as though it lasts longer with each further injection. In more acute cases one or two injections have been enough to banish the pain for two or three weeks (the present observation time)." — Lewin, E., and Wassén, E., *Lancet* 257:993, (Nov. 26) 1949.

[Ed. Note: In subsequent issues of the *Lancet* (December 10, 17, and 31, 1949, and February 4, 1950), several reports of immediate results similar to those of Lewin and Wassén are recorded, but the dramatic immediate results in rheumatoid arthritis were not obtained by three other groups. No claims of permanent benefit nor of harmful effects have yet been made. The duration of the response varies from a few hours to several days.]

CARCINOMA OF THE LUNG

By O. C. Brantigan, M. D., Baltimore, Maryland

Cancer causes 150,000 deaths in the United States each year and it is estimated that 500,000 people have the disease at this time.[21] It is believed that primary carcinoma of the lung is superseded in frequency only by malignancy of the gastrointestinal tract, skin, and prostate,[14] and that 5 to 10 per cent of all cancer deaths result from primary carcinoma of the lung.[13, 15, 19] Whether or not there is an increased incidence of carcinoma of the lung is challenged.[4] Surely the condition is recognized more readily now than formerly. In 1912 Adler[2] could find only 374 cases reported in the world literature. Overholt[17] in 1949 reported upon 604 such patients seen in his practice. Improved methods of diagnosis and an alertness for the disease bring about the diagnosis much more frequently than ever before.

There is no specific knowledge concerning the etiology of the disease. The lungs develop from a budding process from the primitive gastrointestinal tract.[17] Therefore, tumors of the lung of epithelial origin are bronchogenic in origin. Pathologically two great groups are recognized, the differentiated and undifferentiated cell types. Of the differentiated tumors there are the squamous cell and adenocarcinoma types. It is impossible to determine any particular type between the two extremes of differentiated and undifferentiated tumors. Rienhoff[20] found squamous cell tumors in 65 per cent and adenocarcinomas in 35 per cent. Lindskog[12] reported the squamous cell type in 37 per cent, adenocarcinomas in 15 per cent, and the undifferentiated cell type in 47 per cent. The author found squamous cell tumors in 30 per cent, adenocarcinomas in 10 per cent, and the undifferentiated cell type in 60 per cent. The more undifferentiated the cell the more malignant is the growth, which is the usual condition in malignant tumors located elsewhere in the body. The undifferentiated neoplasm and the squamous cell type are more likely to occur in the central or hilic portion of the lung, whereas the adenocarcinoma often occurs in the periphery of the lung. The undifferentiated tumor is the most invasive.

NO SIGNS

There are no characteristic signs and symptoms of carcinoma of the lung. The From the Department of Surgery, School of Medicine, University of Maryland symptoms produced by carcinoma of the lung are so variable that it is difficult to give a clear, concise symptomatology. One patient may have difficulty swallowing caused by pressure of the tumor on the esophagus before there is a single pulmonary symptom. Another patient may present symptoms arising from a metastatic tumor rather than from the primary tumor in the lung. In metastatic tumors of the brain slightly more than 50 per cent develop from primary tumors of the lung.[7] Therefore, there are those patients with carcinoma of the lung who have no pulmonary symptoms. Of the group that shows pulmonary symptoms the most characteristic triad consists of chronic cough, hemoptysis, and pain in the chest. Any chronic pulmonary symptom should make the doctor suspicious of primary carcinoma of the lung if it develops in a male patient over forty years of age who previously was free of pulmonary disease.

Early diagnosis offers the greatest field for advancement in the care of patients with cancer of the lung. Diagnosis can be made by a histologic study of the tissue or cells or by clinical means.

OBTAINING TISSUE

The methods of obtaining tissue for study are through bronchoscopic biopsy, aspiration biopsy, or biopsy of distant metastasis, whereas cells can be obtained from sputum, bronchial secretions obtained by bronchoscopy, pleural fluid, or from needle puncture of the tumor. In bronchoscopic examination a biopsy of the tumor can be obtained only if the tumor is in one of the major bronchi. Bronchoscopic examination of patients with carcinoma of the lung yields positive biopsies in 78 per cent as reported by Hollinger,[10] 65 per cent as reported by Graham,[8] and 37.9 per cent as reported by Ochsner.[14] Clerf[6] believed that only 10 per cent of the cases diagnosed by bronchoscopic biopsy were operable. The percentage of positive biopsies revealing carcinoma will depend upon the selection of cases presented for bronchoscopy. Bronchoscopic examinations need not be made in patients who have distant metastasis that reveal carcinoma on biopsy and in those with pleural fluid in which carcinoma cells are found. Consequently, it is unnecessary where the mass is located in the periphery of the lung. The report of Clerf is more compatible with the present reports since only selected cases were presented for bronchoscopy, obviously inoperable patients were not bronchoscoped, and the yield of positive biopsy was 16 per cent.

Positive biopsy for carcinoma obtained from distant metastasis will establish an exact diagnosis; it offers the patient no chance of treatment but does save him from useless exploratory thoracotomy. Biopsies of distant metastasis are made predominantly from cervical lymph glands but have also been obtained from subcutaneous nodules, ulceration on the toes, and from bone.

CELL STUDY

The cell study of sputum or bronchoscopic secretions offers a splendid method of positive diagnosis for carcinoma of the lung. However, it requires an expert to interpret the findings. Whether the cell study shows malignancy or an absence of malignancy must in every case be verified by clinical and roentgenographic findings. In this manner it varies from tissue diagnosis. If the cell study reveals malignancy in the sputum the tumor site may be in the mouth, nose, pharynx, esophagus, larynx, or tracheobronchial tree. On rare occasions pieces of tissue will be expectorated and if this material is recovered and sectioned a true tissue biopsy will result. The cell study of bronchoscopic secretions limits the tumor site to the bronchi. Herbut and Clerf[9] reported malignant neoplastic cells identified in bronchial secretions in 90 per cent of 237 patients with carcinoma of the lung. In the present series the results of cell studies of sputum and bronchial secretions have been disappointing. However, cell studies interpreted by an expert add greatly to the ability to make an early diagnosis. A negative sputum report now must be qualified by affirming that it is negative for malignant neoplastic cells. Particular caution must be exercised when the cell study is positive for malignancy and the clinical and roentgenographic studies are questionable or fail to verify the cell diagnosis of malignancy. Certainly if palpation does not reveal the presence of malignancy when an exploratory thoracotomy is done the lung must not be removed on the basis of a positive cell study for malignancy.

PLEURAL EFFUSION

In carcinoma of the lung without infection pleural effusion indicates pleural metastasis. In the later stages it is usually sanguinous. In many instances malignant cells or groups of cells can be recovered, and on many occasions it will be the only method of obtaining a positive histologic diagnosis. If a diagnosis cannot be obtained by other methods the tumor may be aspirated with a needle. The cells or tissues obtained can be studied and often result in positive histologic diagnosis. Aspiration biopsy carries the risk of implanting the tumor in the chest wall; however, its use is justified in patients of the old age group or in those instances where the diagnosis is questionable and exploration would be dangerous because of the poor general condition of the patient.

The other methods of diagnosis are clinical. Accurate clinical diagnosis is obtained in a high percentage of the patients studied. When biopsy is unobtainable through the bronchoscope there may be enough findings to justify a clinical diagnosis of primary carcinoma of the lung. Bronchoscopic observation of fixation, compression of the bronchial lumen, stricture formation, widening of the carina, or spurs between bronchial orifices are all signs of malignancy. Occasionally a tumor can be seen but a biopsy cannot be obtained. When the results of clinical observation and positive biopsies are combined the bronchoscope becomes one of the most important instruments in the diagnosis of carcinoma of the lung. In the present series 56 per cent of the bronchoscopic examinations resulted in a correct diagnosis of carcinoma of the lung. This coincides with 55 per cent reported by Herbut and Clerf.[9]

CERTAIN FINDINGS

There is no absolute roentgenographic evidence of malignancy of the lung. Nevertheless, there are certain findings that are often characteristic of carcinoma of the lung. The single round mass in the periphery of the lung is the result of primary carcinoma in a high percentage of patients. However, it may result from a fluid filled cyst and other causes, especially tuberculoma in the younger age group. There is often segmental or lobar emphysema. This is the stage where air enters the bronchus but because of the presence of a tumor the normal contraction of the bronchus on expiration causes obstruction to the escape of air from the alveoli. The tumor finally obstructs the bronchus completely and, depending upon the location, there will be atelectasis of a segment, a lobe, or of the whole lung. Therefore, unexplained atelectasis, especially if preceded by emphysema, often is characteristic of malignancy of the lung.

Roentgenographic views taken in the various positions are of the utmost importance. Increased hilar density in the lateral roentgenogram is an important sign of a central or hilar malignancy. Bronchography may be extremely helpful in reaching a clinical diagnosis. It may show bronchial obstruction or even a nitching of the bronchus that will lead to a diagnosis of carcinoma of the lung, or possibly permit a diagnosis of bronchiectasis to be made which will account for hemoptysis and thus aid in ruling out carcinoma. Laminographic studies may be helpful. The various roentgenographic types of examination are undoubtedly the most valuable single method of diagnosis. Mass roentgenographic studies promise a great deal in early diagnosis of carcinoma of the lung if every abnormal finding is studied thoroughly. No patient in the present series had a negative roentgenograph of the chest.

CLINICAL SIGNS

Clinical signs and symptoms often lead to a diagnosis of carcinoma of the lung. A helpful classification follows:

I. Carcinoma of the lung without pulmonary symptoms
   - A. Without metastasis
   - B. With metastasis producing symptoms not associated with the lung

II. Carcinoma of the lung with pulmonary symptoms
   - A. Patients without previous pulmonary disease
     1. Insidious onset of chronic pulmonary symptoms
     2. Sudden onset of acute pulmonary symptoms
        - a. Pneumonia
        - b. Lung Abscess
   - B. Patients with known chronic pulmonary disease of long standing.

In the group of patients with carcinoma of the lung without pulmonary symptoms the outlook seems grave and impossible of solution. However, the increase in mass roentgenographic examinations of the chest in industry, schools, and by the public health departments offers considerable encouragement when early diagnosis is considered. It can be expected that soon all patients admitted to hospitals everywhere for any reason will be given a routine roentgenographic examination of the chest. Of course, it will be necessary to identify all abnormal roentgenographic shadows thus revealed. Routine roentgenographic examination is the only possible method of detecting carcinoma of the lung where no pulmonary symptoms are present.

BEST OPPORTUNITY

Patients with no previous pulmonary disease who develop carcinoma of the lung with pulmonary symptoms offer the best opportunity for early diagnosis. Any patient thirty-five to forty years old or older who develops a chronic pulmonary symptom of any type should be suspected of having a carcinoma of the lung until such a diagnosis can be proved false. The thought of pulmonary carcinoma must be ever present in the mind of the physician. The expectoration of blood is always worthy of a complete study to eliminate the possibility of carcinoma of the lung; and in such a patient the prognosis must be considered grave until the cause of the bleeding is definitely determined. The classical triad of symptoms, cough, expectoration of blood, and pain in the chest is pathognomonic of carcinoma of the lung. The typical pain is constant and deepseated in character and should be distinguished from the pain of pleurisy. Unfortunately, the triad of symptoms is often a late manifestation of carcinoma of the lung.

In many patients who have carcinoma of the lung the pulmonary symptoms are ushered in by the sudden onset of acute pulmonary infection, either pneumonia or lung abscess. The patient whose illness can be proved to be pneumonia and who responds promptly to the proper chemotherapy may still have carcinoma of the lung. A diagnosis of carcinoma of the lung must be strongly suspected when the older patient who has pneumonia fails to absorb the lung lesion demonstrated by physical examination and roentgenography. In the past this condition was frequently diagnosed as unresolved pneumonia. The older patient with unresolved pneumonia must always be suspected of having carcinoma of the lung. When an older patient suddenly develops a lung abscess the possibility of diagnosing an associated carcinoma is practically out of the question unless it can be demonstrated by bronchoscopy or by bronchial secretions obtained by use of the bronchoscope. Unlike pneumonia the lung abscess is a chronic disease and there is no specific therapy. Should the abscess heal completely in a few weeks the presence of carcinoma can readily be eliminated. If the abscess persists as a chronic lung abscess, as it is likely to do, the presence of carcinoma will defy detection until it is too late for treatment or until it is externally drained and, of course, external drainage of the carcinoma

will preclude any curative surgery. Excision of the abscess would reveal its true identity and for this reason is highly recommended.

CONCEALED SYMPTOMS

Patients who have a well established and accurately diagnosed chronic pulmonary disease can, and often do, develop carcinoma of the lung. The chronic pulmonary disease may possibly conceal the symptoms of the carcinoma until it is too late for treatment. Unfortunately, the chronic pulmonary disease will often mask or obscure the roentgenographic findings of the early carcinoma, and the true diagnosis will not be suspected until it is too late to offer the patient surgical treatment for the carcinoma. It is easy to suggest that a change in the patient's symptom complex should be carefully studied and evaluated. However, it is not so simple when the patient presents the combined diseases for diagnosis. This group probably will defy early diagnosis but constant consideration of the possibility may be helpful.

Age is no real help in the diagnosis of carcinoma of the lung since Ochsner[13] reported one patient age twelve years and Rienhoff[20] one patient nineteen years old with the disease. In diagnosis sex is of great importance because Rienhoff[20] reported the incidence of male to female as six to one and in the present series it is sixteen to one. When there is no positive histologic diagnosis of carcinoma of the lung there will always be an element of doubt concerning the clinical diagnosis, and there will be patients with abnormal roentgenographic findings in whom clinical diagnosis of the disease cannot be made. These patients should be subjected to exploratory thoracotomy. If histologic diagnosis can be made by frozen section when the chest is open there is little chance of an incorrect diagnosis. There is, however, the situation associated with lung abscess or where a centrally placed small mass will defy an accurate diagnosis until the lobe or lung is removed.

EXPLORATION

Once a diagnosis of carcinoma of the lung has been made or exploration has been decided upon, it becomes imperative that the signs of inoperability be sought out carefully in order to avoid a useless operation. These signs are all evidenced by spread of the growth beyond the confines of the lung, either by local extension or by metastasis. Metastasis may occur anywhere in the body; sometimes it can be found by careful physical examination. A thorough search must always be made for a palpable Virchow's gland. If abnormal lymph glands are discovered anywhere or if subcutaneous nodules are found, they should be examined for malignancy. Metastasis to bone can be ruled out by roentgenographic examination. If a rib is shown to be eroded, the tumor often should be considered inoperable. However, occasionally the ribs and the surrounding tissue can be removed in a block dissection together with the lung. If the ribs and vertebrae are eroded, the growth is inoperable. Nerve paralysis may occur; this is always the sign of local extension or metastasis beyond the lung and usually indicates inoperability. Vocal cord paralysis generally occurs on the left side since the recurrent laryngeal nerve extends posteriorly to the aortic arch on the left and thus has a long course through the thoracic cavity. Paralysis of the phrenic nerve may occur and will manifest itself by a high diaphragm with absence of motion. Horner's syndrome may be present and results from invasion of the first and second dorsal sympathetic ganglia and the sympathetic trunk. The opposite of Horner's syndrome must not be confused with the condition, since it results from stimulation instead of paralysis of the sympathetic trunk and its first two dorsal sympathetic ganglia. In such patients the lung usually can be removed. The Pancoast syndrome may be present and indicates a more extensive invasion by the neoplasm than is found in Horner's syndrome. It, of course, signifies invasion of the first dorsal and sometimes the eight cervical nerve roots, as well as the sympathetic trunk with the first and second dorsal ganglia. The presence of pleural fluid is usually a sign of inoperability and indicates metastasis to the pleura. The size of the tumor may also be considered an evidence of inoperability. A tumor mass that fills half the chest cavity on one side generally is beyond surgical help. Extreme emaciation often is a sign of metastasis even though such metastatic lesions cannot be demonstrated.

PREOPERATIVE TREATMENT

The preoperative treatment of a prospective pneumonectomy patient is of utmost importance. If the hemoglobin determination is low it should be raised to within normal range by repeated blood transfusions. The patient should be given equal quantities of sulfamerazine and sulfadiazine and also penicillin in order to guard against postoperative pneumonia. If there is purulent expectoration it is well to give aerosol penicillin before operation. Preparation should be made for ample blood transfusions at operation.

At the time of operation there are three positions that can be used. The lateral position with lateral approach affords the maximum of exposure but is the most difficult for the patient since the weight of the diseased lung, the heart, and the mediastinum will fall upon and reduce the volume of the healthy lung that is on the bottom. Secretions from the lung being removed can fall easily into the bronchus of the good lung and be widely disseminated through the bronchi and even the alveoli. The supine position with the anterior approach eliminates these difficulties but the exposure is limited especially in the inferior aspects of the thorax and about the inferior pulmonary vein on the left side, particularly if the heart is enlarged. The anterior approach, however, is the quickest of the three and is followed by less postoperative pain. The prone position, as described by Overholt,[16] with a posterolateral incision perhaps is the best position. It affords almost as much exposure as the lateral position, with less hazard to the cardiorespiratory effort of the patient than the lateral or even the supine position. Furthermore, there is better bronchial drainage than in either of the two other positions. Because of the adequacy of exposure and the conservation of cardiorespiratory effort the operability is increased. By means of the supine position and the anterior approach Rienhoff[20] resected the lung in 34 per cent of his patients. In the present series the lung was resected in 58 per cent of those subjected to operation, using first the anterior or the lateral position and later the prone position with posterolateral approach. The prone position is more difficult for the anesthetist and the opening and closing of the incision requires more time. Both the lateral incision and the posterolateral incision are accompanied by more postoperative pain than the anterior incision.

PNEUMONECTOMY

Pneumonectomy is the generally accepted operative treatment. The lesser operation of lobectomy, even if one should wish to do it, is rarely possible except where there is a small peripheral tumor. Such tumors constitute less than 10 per cent of the patients affected with carcinoma of the lung. In patients with known cardiac disease and in those over sixty-five years of age, lobectomy, if possible, is the operation of choice since in this group the operative mortality for pneumonectomy is extremely high.[5]

The standard technic now consists of dissecting and individually dividing the pulmonary artery, pulmonary veins, and bronchus. Closure of the bronchus is a fairly standard procedure, with a variation only in the number and location of nonabsorbable sutures. Almost all surgeons cover the bronchus with pleura or some other tissue. Removal of adherent areas of the lung is done by extrapleural separation. If the

condition extends to the ribs, chest wall, or pericardium these invaded structures are removed by block dissection without separation from the mass or lung. The care of the empty pleural space is more variable; some surgeons drain it temporarily, others never drain; some use plasma or saline in the space at completion of the operation whereas others instill penicillin as a bactericidal agent. The author uses a mixture of sulfanilamide, azochloramid, and sodium tetradecyl sulfate as an antiseptic in the empty pleural space upon completion of the operation. Not only is the mixture an antiseptic but it seems to eliminate pleural effusion, and accordingly it is extremely rare that aspiration of the pleural space is required after pneumonectomy. In the presence of gross contamination at operation the pleural cavity is not drained. The mixture is instilled into the pleural cavity upon completion of the operation and then the pleural cavity is aspirated and instilled on three successive days postoperatively, or until the cultures become negative. This procedure of treatment has prevented empyema in thirteen out of fourteen consecutive contaminated pneumonectomies for all conditions including tuberculosis and lung abscess.[3] In the present series empyema occurred in two patients and both infections developed before the mixture of sulfanilamide, sodium tetradecyl sulfate and azochloramid was used and before penicillin was available.

POSTOPERATIVE TREATMENT

The postoperative treatment consists of protection from shock, cardiorespiratory failure, infection, and embolism. Protection from shock must be continued for about three days since these patients exude fluid into the empty pleural space and they can go into shock after much longer periods of time than most surgical patients. Shock is best controlled by repeated hemoglobin and hematocrit determinations made at hourly intervals immediately after operation, then gradually lengthening the intervals of determination until they are done only three times during the third postoperative day if the patient's condition is stable. At any time hemoconcentration is revealed the patient is given blood or plasma in sufficient quantities to overcome the change. The oxygen tent is a help in the immediate postoperative control of shock. Adrenal cortical extract injected intravenously is of great assistance in the prevention and treatment of shock. No patient in the present series died as a result of shock. The patient is kept in an oxygen tent at least three days and at the first sign of cardiac irregularity or decompensation digitalis is administered. The most frequent cause of death in these patients is cardiac failure.[14] Six of thirteen deaths in the present series were from cardiac failure. In spite of extreme diligence this cause of death cannot be eliminated. Early ambulation[5] is usually withheld for this reason, but care is taken to cause frequent turning in bed and considerable motion of the lower extremities.

Despite such diligence one patient in this series died from a pulmonary embolism originating in the pelvic veins which was confirmed by autopsy. After operation the sulfonamide drugs are discontinued but penicillin is given together with either streptomycin or aureomycin. This antibiotic treatment is continued for approximately five to seven days. There have been no postoperative infections in this series, either in the pleural cavity, lungs, or wound, except the two instances of empyema previously described.

PRESENT TREATMENT

The present series began in 1941 and consisted of 119 patients whose condition was diagnosed as carcinoma of the lung. Seventy-three or 61 per cent of the total were subjected to operation. In the group subjected to operation forty-three or 59 per cent were resected. The hospital mortality was thirteen or 30 per cent, three patients dying about one month after operation from cardiac failure after seemingly recovering from the operation. Of five patients sixty-five years of age or older four died in the postoperative period. There were thirteen patients whose disease extended into the pericardium, left auricle, or ribs and four of them died in the immediate postoperative period. Thirty patients survived operations, completed one or more years ago, but it was impossible to follow five of these. Six lived more than one year and seven died in less than a year. There are twelve still living and eleven of these are well. Of those living and well the survival time is as follows: eleven patients one year or more; five patients three years or more; two patients four years or more, and one patient eight years and five months.

The following mortality figures are reported in the literature: Graham[8] wrote that in early years 53 per cent died of operation, but from January 11, 1945 to September 20, 1948 the operative mortality was 7 per cent. Rienhoff[20] reported 22 per cent total mortality from 1933 to 1946; in Ochsner's[15] report the total mortaility was 24.4 per cent, but since 1942 the operative mortality has been 18 per cent. Lindskog's[12] records showed a total operative mortality of 25 per cent. Jones[11] reported a total operative mortality of four per cent. Adams[1] believed the total operative mortality to be 14.3 per cent, but in the last five years this was reduced to 5 per cent. Burnett[5] reported the total hospital mortality at 27 per cent.

CASES CLASSIFIED

In this series of 119 patients seventy-three or 61 per cent were subjected to exploratory thoracotomy and forty-three or 58 per cent of those explored were resected. Graham[8] reported on 434 cases; 251 or 58 per cent were subjected to exploratory surgery and 101 or 40 per cent of those explored were resected. Rienhoff[20] wrote that of 327 patients who were explored 112 or 34 per cent were resected. Ochsner[14] reported on 548 patients; exploration was recommended in 354 instances, but forty-seven patients refused the operation and 307 or 56 per cent were explored. Of these 195 or 63 per cent were resectable. Lindskog[12] reported on 100 patients; surgery was advised in thirty-five cases, but three patients refused; thirty-two were subjected to exploration and twelve or 37 per cent resected. Jones[11] recorded a total of 196 patients, of whom seventy-eight or 39 per cent were considered operable; sixty-six accepted exploration and thirty-nine or 59 per cent of these were resected. Burnett[5] reported on 429 patients of which 149 or 34.7 per cent were considered operable, and of these sixty-seven or 45 per cent were resected.

When a group of patients with carcinoma of the lung is considered there are several variables that will affect the mortality rate. If great caution is exercised many will not be subjected to exploration. Once the exploration is carried out the mortality rate will depend upon the age of the patient and the condition of the cardiorespirtatory function. If the age is above sixty-five the mortality rate will increase greatly. With extension of the growth beyond the lung into the pericardium, mediastinum, or chest wall the mortality rate will rise rapidly if resection is done.

The results of pulmonary resection for carcinoma of the lung depend greatly upon the extent of the growth. If it is a small growth, either centrally or peripherally placed, the operative technic will be similar to the removal of a normal lung. The operative mortality rate will be rather low. If the growth is early and small the longevity or survival period after a successful resection probably will be greatly lengthened. Since most patients have far advanced growths before being subjected to operation the end results must necessarily be poor. Rienhoff[20] reported that 70 per cent of 112 resectable lungs showed extension to bronchial and tracheal glands. Ochsner[14] wrote that of 195 resected lungs for carcinoma only fifty-seven

or 27.2 per cent were without extension of growth beyond the lung or without metastasis and could reasonably expect a satisfactory survival period or cure. It is generally agreed that the differentiated tumor offers the longest survival period and of the two types the squamous cell tumor presents the better survival time. Graham[8] found that of fifty-three patients who had successful resections before 1942, fifteen or 28 per cent were well for five or more years. However, 57 per cent of these patients had bronchial adenomata.

CASES EXCLUDED

Most workers exclude these cases from their records of carcinoma of the lung. In reality, it makes the five year survival average about 14 per cent of those who had successful operations. Rienhoff[20] reported twelve patients who have survived operation for five years or more. Overholt[17] had ten patients or 24.4 per cent of those operated upon successfully who lived for five years or more. Ochsner[15] wrote that thirteen or 23 per cent of the patients who had resections five or more years ago were still alive. He also said that in the palliative resections 10 per cent of the successful pneumonectomy patients had a three year survival period.[14] Lindskog[12] reported one patient alive five and one-half years after operation. Adams[1] recorded six or 35.3 per cent of his patients who survived five years or more, but only four or 23.5 per cent were well more than five years after operation. In the present series only one patient survived more than five years and he is alive and well eight years and five months after operation. If a patient is subjected to operation before the growth extends beyond the lung by extension or metastasis it seems that approximately 20 to 25 per cent will remain well 5 years or more. Ochsner[13] compared the gross survival rate of carcinoma of the lung with that of carcinoma of the stomach and found them essentially the same. When an average patient with carcinoma of the lung presents himself for treatment his chance of being alive five or more years is about 5 to 8 per cent.[16, 5] Earlier treatment cannot be carried out since operation is always performed promptly when the patient is referred to the surgeon. Earlier diagnosis will materially change the percentage of good results since fewer will die as a result of operation and these will have the chance of a long time survival period; furthermore, earlier diagnosis will cause a greater number to be treated before extension or metastasis takes place. Therefore, a greater number will survive five years or more.

One can do no better than repeat the plea made by Adler[2] in 1912: "In conclusion, the writer may be permitted to express the hope that malignant disease of the lungs, so disastrous in its results, may perhaps in the near future be summarily dealt with in its incipiency or at least modified in its progress, so as in some measure to assist in diminishing the suffering of humanity."

SUMMARY

1. Carcinoma of the lung accounts for 5 to 10 per cent of all cancer deaths.
2. Chronic pulmonary symptoms and abnormal shadows on roentgenograms should be thoroughly investigated with the thought of carcinoma of the lung always in mind.
3. In the overwhelming majority of patients when carcinoma of the lung is diagnosed it is far advanced.
4. In order to improve the immediate operative mortality and the five year survival rate after pneumonectomy, carcinoma of the lung must be diagnosed earlier.

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"IF"

If you stay in bed when all about you
Are leaving theirs and doing as they choose;
If you can keep on fighting the bacillus
And never a moment think you'll lose;
If you can send short notes to all your loved ones
In answer to long letters written you
And still continue to keep them free from worry
Since you are doing what seems best to do;
And then, if after months and months of chasing
When you believe the cure is almost won
You are calmly told, "You have a new involvement"
And you begin another race to run;
If you can gather strength from disappointment,
Nor let it presage trouble more,
But help your fellow chasers with their burdens
And you have more trust in man, more faith in God than e'er before;
If you can refrain from burdening someone else with all your troubles,
And remember that they, too, have some to spare;
If, in your exalted opinion, everyone else is wrong but you,
But still allow others a little consideration,
Knowing they have versions, too,
If you can do all this, nor play the martyr,
And score the good and bad of fate's span
You'll win a cure, and surely you'll deserve it,
And what is more, you'll be a better man.

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CARCINOMA OF THE LUNG*

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I consider it a privilege to have been invited here to discuss this important subject. It is highly satisfying to those of us who are interested in the field of thoracic surgery to learn that most of our medical colleagues are joining with us to wage an all out war against such a formidable foe. Ten years ago Dr. Middleton,[1] also from Wisconsin, discussed this same subject at your annual meeting. He pointed out the signs and symptoms one should expect to encounter, but at that time could offer very little of an encouraging nature regarding treatment.

Bronchogenic carcinoma was considered a rare disease for many years. It was most frequently diagnosed at the autopsy table. Certainly, if recognized during life, the hopelessness of this condition was accepted because no effective treatment was known. It has been noted during the past twenty years that bronchogenic carcinoma is being more frequently diagnosed, and we have learned that the disease is not rare but occurs almost as frequently as any other malignant disease in the male. Ochsner and DeBakey[2] (1939) found at the Charity Hospital in New Orleans that bronchogenic carcinoma was the most common visceral cancer. Similar reports have come from other large urban centers. Many of these cases are being seen today but are unrecognized because the attending physician is not cancer conscious, and through the omission of the proper available diagnostic procedures fails to arrive at a correct diagnosis at a time when definitive treatment would effect a cure. However, an increased interest has been developed by the internist, anesthetist, and surgeon since Graham[3] reported the first successful pneumonectomy for carcinoma of the lung in 1933. This patient, a physician, is still alive and successfully carrying on his practice. Since then many such operations have been carried out until today, particularly in the large medical centers, such procedures are considered routine. We still have a long way to go, especially in the recognition of the disease, since on the average at least eight months elapse before these patients reach the surgeon. This is either because the patient fails to seek early medical advice or the attending physician fails in his diagnosis. Much can be done through cancer propaganda to bring the patient to the physician earlier. This is particularly important since most carcinomas of the lung are seen in males of the older age group. The female is afflicted with the disease only about one-tenth as often as the male.

SIGNS AND SYMPTOMS

Bronchogenic carcinoma, like malignancy in other organs, is insidious in onset. There is as yet no satisfactory method to determine the early transition of the normal cell to the malignant one. Varying periods of time elapse before signs and symptoms occur. The location of the growth is an important factor. During the early or latent phase the patient enjoys good health and is asymptomatic. As the growth of the tumor continues, and since over 90 per cent occur in the bronchus, it is not strange that a cough should appear early as a result of irritation due to destruction of tissue in the bronchial mucosa. It is at this stage that there is evidence that the process is well developed. Cough occurs among so many people, particularly cigarette smokers, that its significance is overlooked. The physician may attach little importance to it at first and may prescribe his favorite cough mixture instead of a careful physical examination. Cough must not be overlooked or treated lightly in any patient, particularly a male over 40 years of age. Careful inquiry should be made as to its time of occurrence or change in character. If there has been any change, it should arouse suspicion and the reason for the change should be determined.

Hemoptysis may first be noted as the character of the cough changes. Early in the disease the sputum may be slightly streaked with blood. This may not

TABLE NO. 1
INCIDENCE OF LUNG CARCINOMA ACCORDING TO AGE AND SEX

Age	Male	Female
20 - 29	2	1
30 - 39	3	5
40 - 49	25	1
50 - 59	42	11
60 - 69	51	8
70 - 79	14	0
TOTAL	137	26

Ratio male to female — 5 to 1

FIGURE I. *Female, age 65. Cough, hemoptysis, dyspnea. X-ray reveals partial atelectasis right lower lobe. Bronchoscopy by referring physician. Biopsy positive for adenocarcinoma right lower lobe bronchus. Right lower lobectomy. Recovery.*

*Delivered at the annual conference of Southwestern Medical Association, Phoenix, October, 1950.

recur for several weeks and at times its occurrence may be entirely forgotten by the patient. The presence of other and more severe symptoms will send the patient to seek medical advice. Profuse or repeated hemoptysis will frighten the patient so much that he will seek advice at once. We know not only that tissue destruction is present at this stage, but also that it is beyond the silent phase and that definitive treatment is obligatory.

Pain appears later than cough and hemoptysis, if the new growth occurs in the bronchus. If it lies in the periphery causing pleural irritation, symptoms may occur much earlier.

Hoarseness results from involvement of the recurrent laryngeal nerve and signifies a spread of the malignancy to contiguous structures. This involvement may occur as a direct spread or through metastasis.

Dyspnea with or without wheezing is indicative of a mechanical block of one of the larger bronchial passages. This may result in an emphysema of the lung parenchyma supplied by the particular bronchus if the egress of air is interfered with. At times infection occurs peripheral to the blocked bronchus producing suppuration, including bronchiectasis and/or lung abscess, with chills, high fever, and night sweats. It is in this type of case that the picture of carcinoma is masqueraded by the suppurative process. Dyspnea may also occur if the ingress of air is interfered with

TABLE NO. 2
SYMPTOMS IN LUNG CARCINOMA

Symptom	Number
Cough	70
Chest pain	34
Dyspnea	24
Hemoptysis	20
Chills and fever	4
Weakness	11
Loss of weight	8
Hoarseness	2
Wheezing	1
Leg and joint pain	3
None	9

TABLE NO. 3
TYPE OF LESION

Epidermoid carcinoma	70
Undifferentiated carcinoma	24
Adenocarcinoma	20
Adenoma?	11
Pulmonary adenomatosis	3
Sarcoma	2
Type undetermined	33
	163

FIGURE II. *Female, age 45. Cough hemoptysis, wheezing, dyspnea and loss of weight. Lateral view shows block of iodized oil in left stem bronchus. Bronchoscopy revealed bronchial growth of obstructive nature. Biopsy revealed squamous cell carcinoma. Pneumonectomy, left. Recovery.*

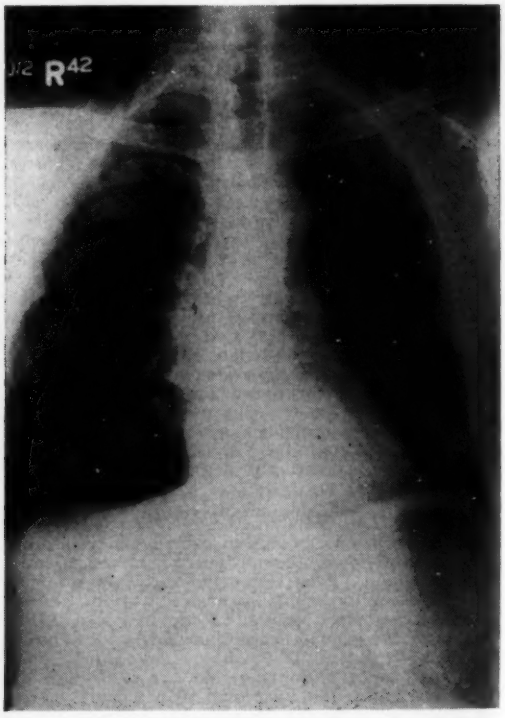

FIGURE III. *Male, age 73. Periodic blood streaking for six weeks. No loss of weight or cough. Rounded shadow beneath parietal pleura right upper lobe. Cytologic and bronchoscopic studies negative. Thoracotomy. Biopsy of tumor revealed adenocarcinoma. Right upper lobectomy. No mediastinal glands. Recovery.*

due to collapse and atelectasis of the involved lobes and associated shift of the heart and mediastinum to the involved side.

PATHOLOGY

Most malignant lesions of the lung occur in the bronchi, usually in the stem bronchus near the trachea. The squamous cell type is the most common, resulting from a metaplasia of the bronchial mucosa. Other less frequent types include adenocarcinoma, undifferentiated carcinoma, and bronchial adenoma. The inclusion of adenoma with a group of malignant tumors may be questioned by some authors, but we have seen these tumors metastasize to distant organs as adenocarcinoma. We are in agreement with Womack and Graham[4] that these tumors are potentially malignant.

TABLE NO. 4
NUMBER ALIVE AFTER SURGERY

	Thoracotomy		
	Resection	only	Untreated
3 to 6 mos.	11	7	2
6 mos. to 1 yr.	11	0	1
1 to 2 yrs.	7	0	0
2 to 3 yrs.	3	0	0
3 to 4 yrs.	2	0	0
4 to 5 yrs.	1	0	0

TOTAL — 45 cases alive

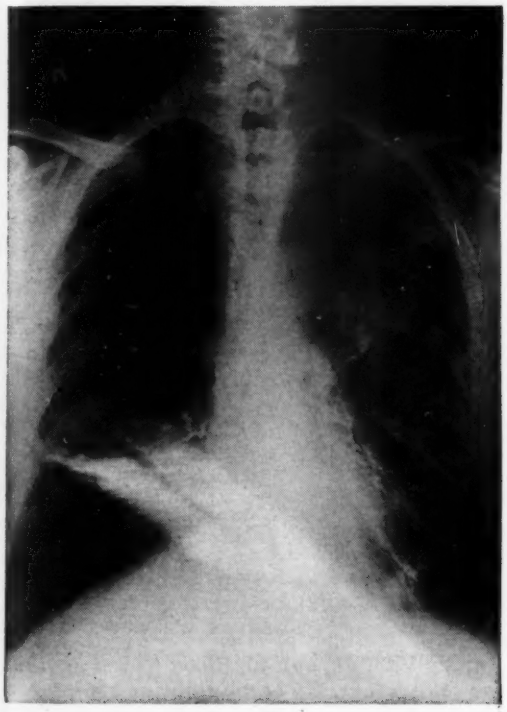

FIGURE IV. *Male, age 59. Cough, hemoptysis, dyspnea, weight loss and chest pain. Indistinctly defined spherical tumor mid lung field. Cytologic study revealed no malignant cells. Right upper lobectomy. All mediastinal glands positive for metastases. Immediate recovery. Patient died eight months later of widespread metastases.*

DIAGNOSIS

The diagnosis of carcinoma can be made early in the disease in over 75 per cent of the cases if care and diligence are practiced. In the later stages the diagnosis is simple but of little use because the condition is then hopeless. One of the greatest assets to the physician seeing these patients is his suspicion that a new growth in the lung is a possibility. A complete history supplemented by careful physical examination and study of the information obtained will clinch the diagnosis. The use of the x-ray in taking films in various positions is invaluable and will frequently disclose abnormal shadows not seen with the ordinary posterior anterior exposure. Bronchoscopic examination affords a method of precision by permitting a visual observation of all the larger bronchial passages. (Figure I) The field of vision can be greatly enhanced by using a telescope which permits still other areas to be examined. The growth, if seen, can be studied as to location and extent of involvement and a biopsy can be taken which will permit an accurate diagnosis. If no growth is seen and no sputum or bronchial secretions are present, saline can be instilled into the bronchial passages of the suspicious area. This is aspirated and cytologic studies are made to determine the presence or absence of malignant cells. This method of Papanicolaou has been of inestimable value to the surgeon if examined by a good pathologist. It has afforded a correct diagnosis heretofore impossible in certain cases without thoracotomy. The cytologic study is also valuable to determine the presence or absence of malignant cells in pleural effusions. Bronchography may be necessary if other methods fail. The introduction of iodized oil into the bronchi leading to the suspicious area will not infrequently outline and clearly demonstrate irregularities, distortions, or block of the bronchial passages. (Figure II) These findings, coupled with other evidence at hand, assist materially in arriving at a correct interpretation. In spite of all the diagnostic procedures we have in our armamentarium, there will be about 20 to 25 per cent of the early cases in which an exact diagnosis will not be made. It is this group that the physician, in view of lack of irrefutable evidence of malignancy, is inclined to sit, watch, and wait. (Figure III) He often feels that he is not justified in recommending an operation without a clearcut diagnosis. (Figure IV) Because of the increasing frequency of bronchogenic carcinoma such procrastination is mentioned only to be condemned. Few of us would sit and watch a tumor of the breast produce axillary metastases before exploring the lesion. (Figure V) The same applies to an undiagnosed lung tumor. Exploratory thoracotomy is no more dangerous than a laparotomy. It does, however, afford a chance to obtain a biopsy and frozen section of the tumor itself, thereby giving an accurate diagnosis.

TREATMENT

The type of treatment to be advised for any disease of a malignant nature is the one which will produce the best results. In dealing with carcinoma of the lung, resection of the involved lobe or lobes and all regional lymph nodes has proven the most satisfactory. There are certain instances which should be mentioned when resection is impossible or has little to offer. At the State of Wisconsin General Hospital we have followed the following operative criteria. (1) We operate upon all cases where a diagnosis cannot be established through the use of other diagnostic procedures. (2) Patients with moderately or even far-advanced disease associated with suppurative complications and in whom no distant metastases can be demonstrated, we feel deserve surgery even though palliative. (3) Removal of a lobe or lobes is carried

out in all cases explored if technically possible. Ochsner et al[5] have stated that 70 per cent of their resections were considered palliative but justifiable since the risk is not excessive and the patient's life span is increased and made more comfortable. We have not felt operation was justified in 1) aged patients with advanced cardiovascular disease or where the physical condition was such as did not even permit the administration of an anesthetic; 2) those patients with involvement of the trachea; 3) the presence of metastases in distant organs; and 4) those patients with a pleural effusion containing malignant cells with or without recurrent laryngeal or phrenic nerve involvement. During the past five and one-half years we have seen 163 cases of proven pulmonary malignancy. One hundred and eight, or 83 per cent, have been explored. Resection was impossible in 54, or 50 per cent, of the explored cases. Resection in the form of lobectomy or pneumonectomy was accomplished in a similar number.

The cases reported in this series are too few to permit the drawing of too many conclusions, were it not for the fact that they are not unlike the results reported by other surgeons. Certain features stand out in our group of cases. We did not see these patients until they had been ill for an average of eight months. The reasons reported for this neglect were about equally distributed between the patient and his physician. The operative mortality in the 108 explored cases was 9 per cent. There is only one patient alive after five years. Perhaps others will survive this period as time passes.

DISEASE RARE

Early in this century carcinoma of the lung was conspicuous by its absence in the medical literature. Very few cases were reported at post mortem, chiefly because the disease was rare. Since then reports of this condition have appeared with increasing frequency. There is little doubt that there is an actual increase in the incidence of this disease. The cause is not known. More people reaching old age, cigarette smoking, the breathing of noxious gases, and various other reasons have been postulated. Time may prove some existing etiologic agent. While this is being done we must meet the challenge at hand and do our best to institute measures to enable us to provide definitive treatment in the early, latent and curable phase of the disease. Just how this is to be accomplished I do not know. Certainly, as previously mentioned, propaganda widely circulated to the smallest hamlet should be of value and should stimulate people to seek earlier medical attention for bizarre and seemingly unimportant symptoms. It appears to the author that the general practitioner, so often known as the backbone of medicine in the United States, is in the most strategic position. He sees the patients first. Alertness and awareness of the possibilities will undoubtedly urge him to follow up these patients more closely and insist that they receive the necessary studies to rule out the presence or absence of malignancy. Not infrequently people consult a physician for a check-up and are told they are in perfect physical condition. Too often this is done without the aid of the stethescope on the chest, a hand on the abdomen, or a blood pressure cuff on the arm. Could some provision be made so that patients might see their physician to keep well? We are being challenged by malignancy in all of its forms, particularly bronchogenic carcinoma because of its rapid increase in incidence. The progress in Wisconsin, although very slow, has been worthwhile. The Wisconsin Antituberculosis Association has toured the state visiting schools, factories, and villages, offering free miniature x-ray films to all. In the event any pathology is noted the patient is advised to see his family doctor at once. This, although only one step in the right direction, has succeeded in the discovery of many pulmonary diseases. We as physicians cannot force people to seek periodic examinations, but through education and suggestion we can stimulate more interest in preventive medicine.

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TABLE NO. 5
LOCATION OF LESION

	Right	Left
Main stem	26	22
Upper lobe	29	20
Middle lobe	11	—
Lower lobe	29	26
	95	68

FIGURE V. ***Male, age 80. Blood tinged sputum for four weeks. No other signs or symptoms. Examined, x-ray studies made, bronchoscopy and bronchogram negative. Cytologic studies negative. Instructed to return in two months. Patient waited six months. Lesion as noted. Thoracotomy. Small round cell carcinoma involving both left upper and lower lobes overriding the fissures. Left pneumonectomy. Recovery. Died nine months later of other causes.***

THE ROLE OF THE LABORATORY IN THE DIAGNOSIS OF EARLY BRONCHOGENIC CARCINOMA

By M. S. Hart, M. D., El Paso

Watson of New York Memorial Hospital estimates that 75 per cent of all patients that come to his service with cancer of the lung have had a previous clinical diagnosis and have been treated for a virus pneumonia. The fate of the patient with lung cancer depends to a considerable extent upon whether the first physician to see the patient thinks of cancer. An average of ten months elapse from the time the first symptoms appear until the lung cancer patient receives competent treatment. About one-half of the time loss is caused by incorrect diagnosis by the first physician to see the patient. With adequate diagnostic methods an accurate diagnosis could be made in about three-fourths of all lung cancers at the time they first consult their physician.

What constitutes adequate diagnostic measures in establishing a diagnosis or ruling out a diagnosis of cancer of the lung? The following are essential before cancer of the lung can be established:

1. Roentgenograms of the lungs, Postero-Anterior position, including inspiration and expiration films, and lateral oblique positions;
2. Bronchogram;
3. Bronchoscopy, including cytological study of bronchial washings or biopsy;
4. Cytological study of productive sputum;
5. Exploratory thorocotomy.

CERTAIN CASES

In certain cases any two of the above may be all that is necessary to establish a definite diagnosis, while in other instances all five of the above must be carried out before cancer can be excluded.

When is a cancer "early"? During the past 10 years a new approach to an old method has come into use. Departments of cytological pathology have been established in most of the medical schools and the surgical pathologist has altered his concepts so that invasion is no longer a criterion for a definite diagnosis of cancer. We know that cancer is not an explosive phenomenon and that there must be a pre-invasive phase. With the data from all of the various medical centers and clinics coming to a focus, we now realize that our concept of cancer must be changed. The studies of the cytology of body fluids has shown that there is, in many instances at least, a relatively long incipient phase in which cancer remains pre-invasive. At the present time the consensus seems to be that the cytological examination of body fluids will offer the best opportunity for a diagnosis of cancer in its "early" stages.

PROFUSE PRAISE

Both the medical and lay literature have been profuse in their praise for this diagnostic procedure, but at the present time the practical value of routine examinations of body fluids and exudates seems to be in doubt. However, all agree that the examination of certain fluids are of definite practical value, and most agree that the examination of vaginal fluids and sputum are both practical and essential in establishing the early diagnosis. Examination of other fluids and exudates offers less from a practical standpoint but may be of definite value in isolated or selected cases, and may become of more value as the technique is improved and cytologists become more proficient.

In well controlled studies it has now been amply demonstrated that in approximately 75 per cent of patients with bronchogenic cancer, cancer cells can be demonstrated in the sputum. The number of false positive tests are proportionate to the experience and training of the cytologist. Many grievous errors have been made, but these are becoming fewer and fewer as the pathologist assumes the responsibility of establishing the diagnosis from cell study alone, and learns the variations in cell changes that characterize true neoplasia.

TUMOR ISOLATION

The isolation of tumor cells from bronchial washings or sputum requires no special or detailed technique. Sputum or bronchial washings may be smeared directly onto the slide and fixed while wet with equal amounts of 95 per cent ethyl alcohol and ether, or the patient may expectorate directly into a container of ethyl alcohol and collect a 24 hour sample that may be either concentrated and stained or blocked and sectioned.

In recapitulation it must be emphasized that all patients over 40 years of age who present themselves with initial symptoms of chest pain, cough, and expectoration, must be suspected of having a primary cancer of the lung and the responsibility for an adequate diagnostic work-up is that of the first physician to see the patient. Three fourths of the patients that do have cancer of the lung can be diagnosed at the time of the first examination. The laboratory procedures at our command are relatively simple and examination of the sputum for tumor cells should be as routine as the examination for bacteria.

OBSTETRICS

Intravenous Alcohol During Labor

Belinkoff, S. & Hall, O. W. Jr., Am. J. Obstet. & Gynec. 59:429, 1950

While not an ideal agent for relief of pain during labor, intravenous alcohol is nevertheless useful in certain instances. Satisfactory analgesia, but not amnesia, was produced in 80 per cent of obstetrical patients given varying amounts of 5 per cent alcohol in normal saline or water* as an intravenous infusion. Intravenous alcohol should not be administered until the patient is in active labor and the cervix 3.5 to 4 cm. dilated.

** Solutions employed were supplied by Abbott Laboratories*

St. Luke's Hosp.

TYPHOID FEVER

Typhoid Fever In An Infant Complicated By Typhoid Meningitis; Therapeutic Failure With Chloromycetin, But Response to Aureomycin

Ripy, H. W., J. Pediat. 36:376, 1950

The patient, a 13-month-old child, failed to respond to Chloromycetin therapy and subsequently developed typhoid meningitis. Prompt clinical and bacteriologic response followed administration of aureomycin.

This report is of particular interest inasmuch as many investigators consider Chloromycetin the product of choice in management of typhoid fever.—Ed.

Vanderbilt U.

NEW BLOOD BANK IN EL PASO

The newest aid to medical service in El Paso and the surrounding area was inaugurated during the month of November, when the Rio Grande Blood Bank, 714 East Yandell Boulevard in El Paso, began operation to make available blood and plasma to doctors, hospitals, clinics and laboratories in the El Paso area.

Culminating a year-long objective by Dr. Alvin L. Perry and his committee of El Paso County Medical Society physicians, (Doctors M. S. Hart, Robert J. Cardwell, James J. Gorman and Ralph H. Homan), the new bank is being opened under the sponsorship of the El Paso County Medical Society, through a cooperative arrangement with the Salt River Valley Blood Bank in Phoenix, which is operated under the auspices of the Maricopa County Medical Society and their committee.

The establishment of the Rio Grande Blood Bank in El Paso marks the beginning of a new era in the care and protection of doctors' patients for an area extending from West Texas to Southern California.

By reason of the bringing together in a cooperative endeavor blood services operated out of El Paso and Phoenix, the service of furnishing whole blood and plasma to hospitals and physicians is offered on a scale not possible before. This arrangement will guarantee blood and plasma transfusions to virtually a million people in an area of about 200,000 square miles, without regard to ability of those individuals to replace the blood used, or pay the low cost of the service.

Territorially, this will be the largest joint doctors' banking operation in the United States.

These blood banks are sponsored by doctors in their respective communities. The El Paso County Medical Society has named their blood banking committee as the medical supervisory board of the newly formed bank. The Maricopa County Medical Society of Phoenix has a similar committee.

Administrative problems of the two banks are coordinated by a non-profit organization, Southwest Blood Banks, Inc.

Because of the similarities of the Southwestern states, the destinies of their youthful and fast-growing communities are comparable and their needs and problems are alike. In time of a disaster or emergency, the two blood banks can act and operate as a unit, meeting the needs of any locality in the Southwest.

The policies and procedures of the newly formed bank will generally follow those used in the Phoenix area, where they have been tested in six years of successful blood banking experience.

The Salt River Valley Blood Bank was established in 1943, by a group of physicians, who had realized for many years that people who needed transfusions must be served without conditioning such service upon the ability of any individual to bear his share of the cost or to replace the blood used.

Accordingly, the bank was incorporated on a non-profit basis under the auspices of the Maricopa County Medical Society, for the benefit of all whom the bank could serve.

The basic philosophy of the physicians who envisioned their blood bank was that the bank should be governed by the same admonition as the Hippocratic oath, which has guided physicians throughout the centuries.

The County Medical Society in Phoenix does not underwrite the expense of the operation of the bank. So, that bank was established to be self-supporting, making a charge for its services based upon its cost of operation.

At first, many many hours of volunteer services by doctors and the good people of the community went into the planning, establishment, and early operation of the blood bank.

As the bank was more able to meet the increasing demands made upon it, and to evolve sounder business and technical procedures of operation, the bank began to operate on a fully paid staff basis, spreading its 24-hour a day service to 80,000 square miles in Arizona, and more recently to areas of California on a routine basis. It has given emergency service to nearby states on many occasions.

Beginning in 1943, with a charge which even today is virtually an average or standard charge for blood throughout the country ($32.50 a pint), the bank in the past six years has achieved for the individual patient a reduction of 40 per cent in the cost of transfusion service.

The management of the bank believes that further substantial reductions in cost of blood to the patient are inevitable.

It is intended that the bank's services in El Paso will be extended both in El Paso and to surrounding areas, as needs arise. In order to achieve and bring to patients the desired economy of a modern transfusion service, it is necessary that the bank serve as wide an area as is feasible. It is hoped that the future will see the extension of this banking service to other fields, as has been done in Phoenix: namely, breast milk banking, possibly bone banking, with the possibility of storage and service of skin, cartilage, arteries and any other service of a similar nature that is needed and can be made available to this area.

It is possible at a future date the two banks may be able to undertake more ambitious projects, with the processing and drying of plasma, or perhaps even the preparation of blood fractions.

Such achievements are possible only in a large scale operation.

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A post-graduate course consisting of eight hours of instruction in disaster preparedness for atomic warfare will be conducted in El Paso on February 2.

This post-graduate course is a regularly scheduled course of instruction sponsored by the Post-graduate Division of the University of Texas, Medical Branch. The course is being brought to El Paso for the convenience of physicians in the area. Certificates for eight hours of post-graduate study will be given to anyone desiring such a statement.

It is probable that there will be an exhibit of instruments used to detect atomic blasts and combat their effects.

SOUTHWEST TO ATTEND

Physicians of New Mexico, Arizona and Northern Mexico as well as West Texas are invited to attend. A registration fee of $5.00 will be charged. Physicians interested in attending are invited to notify Dr. E. Ivan Bruce, Jr., director, Post-graduate Division, University of Texas, Medical Branch, Galveston, Texas. The tentative program is as follows:

8:00 - 9:00 — Registration

9:00 - 9:15

Outline and Introduction.....Dr. T. G. Blocker, Jr.

9:15 - 9:45

Organization for the Care of Victims of a Disaster & Atomic Warfare.....Dr. R. M. Moore
Alternates (Dr. C. D. Leake, Dr. J. Ewalt, Dr. C. T. Stone)

9:45 - 10:15

Pathology of Victims of an Atomic Blast.....Dr. Paul Brindley
Alternate (Dr. R. H. Rigdon)

10:15 - 11:00

Medical Aspects of Irradiation.....Dr. C. T. Stone
Alternates (Dr. G. R. Herrmann, Dr. R. Gregory, Dr. W. L. Marr, Dr. W. C. Levin)

11:00 - 11:45

Extremity Injuries and Their Care.....Dr. G. W. N. Eggers
Alternate (Dr. W. H. Ainsworth)

LUNCHEON ADDRESS

11:45 - 1:45

Problems of the Profession with Regard to Medical Preparedness.....Dr. William Gambrell
Alternates (Dr. R. A. Trumbull, Tyler; Dr. A. T. Stewart, Lubbock; Dr. George Turner, El Paso)

1:45 - 2:30

Abdominal Injuries.....Dr. R. M. Moore
Alternates (Dr. E. J. Poth, Dr. A. O. Singleton, Dr. J. M. Thiel)

2:30 - 3:15

Treatment of Burns.....Dr. T. G. Blocker, Jr.
Alternate (Dr. S. R. Lewis)

3:15 - 4:00

Care of Neurosurgical Injuries.....Dr. S. R. Snodgrass

4:00 - 4:45

Care of Thoracic Injuries.....Dr. A. E. Harrison

4:45 - 5:30 — Panel Discussion

DINNER

8:00 - 9:15

Health and Emergency Medical Services.....Dr. Geo. W. Cox

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